



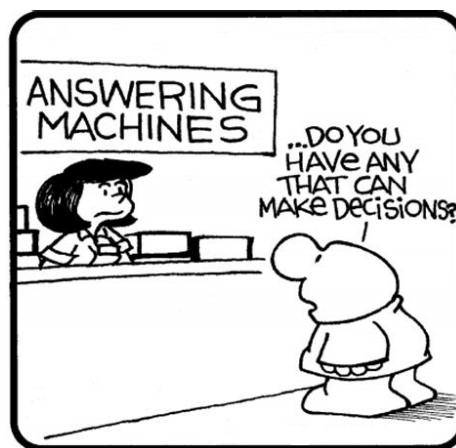
➡➡➡ **No Meeting in January** ⬅️⬅️⬅️

**Next Meeting**

**Sunday 13<sup>th</sup> February**

**Details will be emailed to members**

**Details also included in February Newsletter**



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# NEVARC 2021

## Christmas Luncheon

This year's NEVARC Christmas party was widely hailed as a great success. Held again at the Birralea Tavern in Wodonga members enjoyed a catered lunch in a lovely setting.

Present were Shane VK3KHS, Steve VK3SMW, Steve VK3NFS, Brenton VK3CM, Phil VK3JPH, John VK3MS, Teegan VK3AAF, Graham VK2ER Marlene (VK2ER XYL), Gary VK2VU, Frank VK2BFC, Rosie (Frank VK2BFC XYL), Matt VK3VS, Peter VK3PTE and Karen (VK3PTE XYL).

An award for appreciation of service was presented to Gary VK2VU for his 5 years of service and establishment of the VK2RWD repeater site.

Some of Gary's achievements as NEVARC Club President are;

- \* Kept the club running through the COVID-19 pandemic
- \* Organised and built the VK2RWC repeater
- \* Made a deal with a commercial client
- \* Stayed NEVARC club President, whilst also being the captain of the local fire brigade and several other community organisations



From left, Gary VK2VU, Frank VK2BFC and Matt VK3VS presenting Gary VK2VU with certificate of appreciation of 5 years service to the club and establishment of the VK2RWD repeater system and site.



↑

From left, Shane VK3KHS, Rosie (Frank VK2BFC XYL), Steve VK3SMW, Steve VK3NFS, Brenton VK3CM, Phil VK3JPH, John VK3MS, Teegan VK3AAF, Graham VK2ER, Marlene (VK2ER XYL)

Everyone agreed that it was a great day and as always the club picked up the tab for the lunch. NEVARC, the club that is always giving back to the members.

This will be a regular yearly occurrence and lets hope next year every member can attend.

*~Frank VK2BFC (Secretary)*

**NEVARC next Foundation licence course and exam  
will be on 9<sup>th</sup> January**

**NEVARC next Standard licence course and exam  
will be on 13<sup>th</sup> February**

**Our next regular meeting, depending on COVID,  
12.00pm Sunday 13<sup>th</sup> February**



# NEVARC WEDNESDAY NIGHT NETS

## 2 Meter Net Check-in Wednesday 8pm Net Control VK3ANE

VK3RWO 146.975 600 kHz, 123 Hz tone

VK3RWC 147.325 -1600 kHz, 123 Hz tone

Can also dial in via VKLink repeaters to  
Node 1301,

Allstarlink node 42124,

Or for those with a hamshack hotline or  
SIP phone, you can get a VKLink  
extension number and dial 1301 as well



# RASA ~ The Radio Amateur Society of Australia



In October last year members of RASA invited NEVARC to an information Zoom meeting.

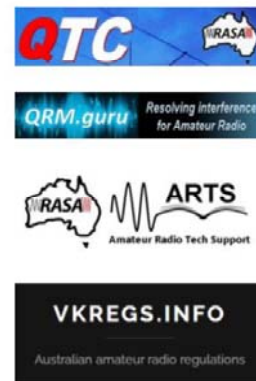
This newsletter article is some of the information presented.

At the end of the meeting NEVARC was offered a QRM Guru Club kit. If any of our members has interference problems they would like to try and sort, the kit is available to all members, just contact Matt VK3VS.



RASA has many areas of support for users of amateur radio.  
Some of there are;

- Quarterly QTC Magazine
- ARTS – Amateur radio tech support
- QRM.guru – RF Interference Support
- VKREGS.info – Plain language ACMA amateur radio rules and regulations
- A comprehensive searchable website of technical help and new licences guides



The Radio Amateur Society of Australia formed early 2018 by five active Amateurs.

RASA is incorporated and registered with ASIC.

Virtual/internet based association, no buildings leased so a very low cost base.

RASA communicate with ACMA & AMC regularly and illustrate that effective representation needn't cost a lot. RASA strive for new and innovative thinking and want to challenge old ineffective methods.

Visit [www.vkradioamateurs.org](http://www.vkradioamateurs.org) for more details.

RASA Achievements in 2020/2021 RASA were communicating with VK Hams regularly & openly.

Club visits were put on hold due to Covid-19.

RASA provided Education & Awareness on VK regulations & ACMA.

QRM Guru, VKRegsinfo site, Welcome to AR Guidebook, Welcome Pack for Newcomers and QTC e-Magazine were all established.

RASA website has Amateur Radio Tech Support and information on the new 2 x 1 Contest Callsigns Details.

### Radio Frequency Interference



Increased HF noise is a major issue in suburbia. There is little to no support help hams deal with interference. Amateurs have been poorly represented in this area for many years.

The Regulator is not going to step in proactively to resolve your noise.

RASA have listened to the VK community: we created an online resource to help address noise issues.

QRM.guru is built on a Knowledge Base platform and was released in March 2019 at PerthTech.

In the last 12 months, QRM Guru has had: 41,245 unique visitors from 168 countries with 140,674 page visits.

### The Truth about Ferrites

<https://qrm.guru/the-truth-about-ferrites/>

This article has been read over 16,848 times across 88 countries since it was published on 12 Feb 2020.

It was listed in DXZones "Best Amateur Radio Links of 2020"

<https://www.dxzone.com/the-best-amateur-radio-links-of-2020/>





*Using a large ferrite ring (Q3), with 4 turns*



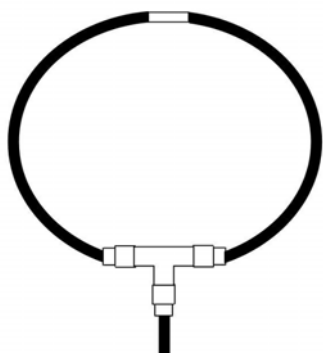
## QRM Kill Kits

The process of tracking down interference is educational. It makes us think about the very nature of radio signals at a basic level.

To assist in this process, RASA has put together more kits.

- DF Loop antenna
- HF Station QRM Kill Kit

We would like to hear your stories of interference problems. The QRM Guru website is growing with the benefit of personal experience. Send your results to: [feedback@qrm.guru](mailto:feedback@qrm.guru)



DF Loop



Club Starter Kit



QRM Kill Kit

## VK Regulations –[www.vkregs.info](http://www.vkregs.info)

Overdue, but important online resource, providing a reference for new and experienced amateurs.



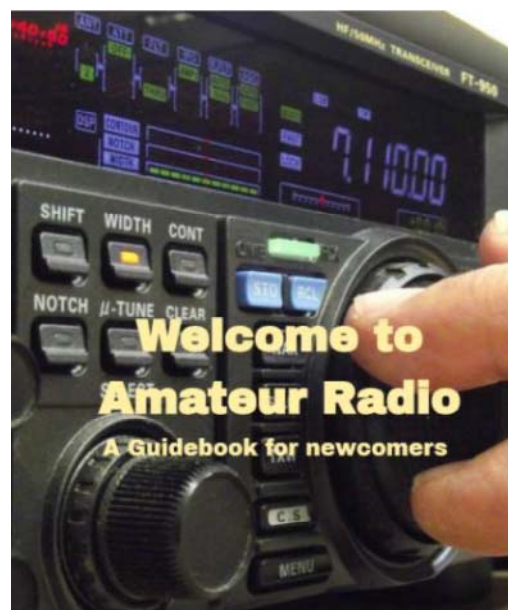


## Welcome to Amateur Radio Guidebook

A free online reference guide for newcomers, helping to bridge the gap between obtaining your licence and getting on-air.

### Table Of Contents

Welcome	2
The ethos and ethics of Amateur Radio	4
Getting On-air	5
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Safety in Amateur Radio	29
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## Welcome Pack for Newcomers

A free hardcopy portfolio of useful and information sheets for documents and information sheets for documents and information sheets for documents and information sheets for newcomers. Helping to bridge the gap between obtaining your licence and getting on –air.  
Free to clubs and examiners.

This pack includes the following:

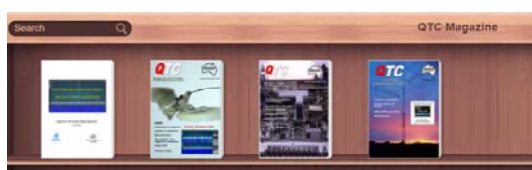
- Welcome letter
- Welcome to Amateur Radio Guidebook
- VK Regulations Handbook
- Getting started with repeaters
- VK Band Plan –Quick Reference Guide –1 page laminated sheet
- List of useful web sites



## QTC Magazine



Visit [www.qtcmag.com](http://www.qtcmag.com) for a true e –mag.





### Station set-up & housekeeping

- Antennas –the basics
- Feedlines
- QRM
- Band Plans
- Getting on the Air
- Regulations

### Online resource with Knowledge Base articles for newcomers

- Ability to raise questions via a ticketing system
- ARTS –providing a safe environment to ask questions from experienced hams

### Reverse Beacon Network



VK3RASA RBN 100kms East of Melbourne  
Thanks to FISTS Morse Code club for the financial grant.

<http://reversebeacon.net/>

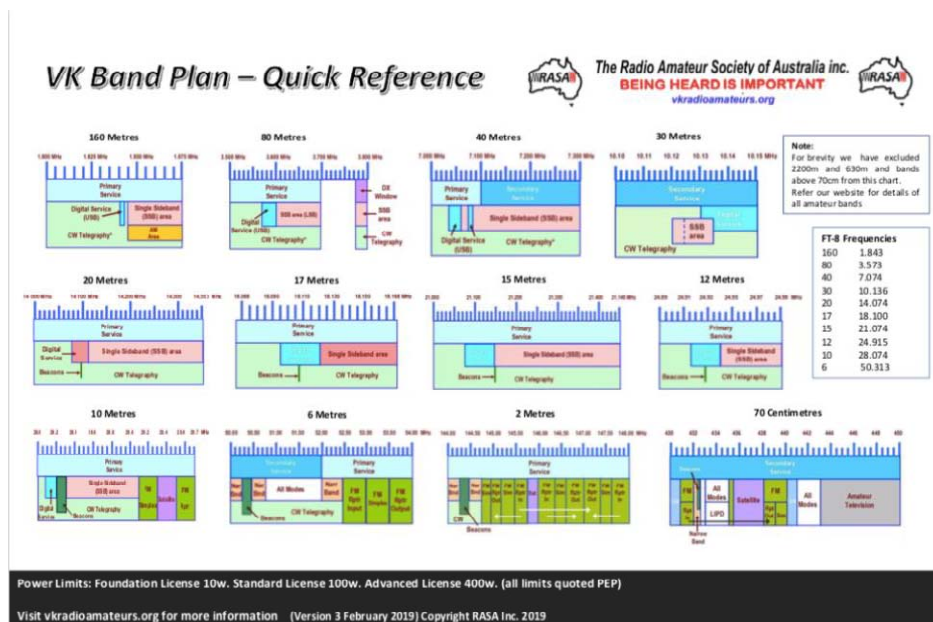
showing spots for spotter call: VK3RASA						
search spot by callsign						
de	dx	freq	cq/dx	snr	speed	time
VK3RASA	R1530IG	3520.0	CW CQ	22 dB	29 wpm	2020z 27 Aug
VK3RASA	8N2OLP	3512.9	CW CQ	16 dB	21 wpm	2008z 27 Aug
VK3RASA	HA7JQK	3519.5	CW CQ	8 dB	29 wpm	2004z 27 Aug
VK3RASA	DL5ANT	7002.5	CW CQ	12 dB	26 wpm	2003z 27 Aug
VK3RASA	SP60VHSC	7010.8	CW CQ	15 dB	26 wpm	1957z 27 Aug
VK3RASA	R4BM	7017.0	CW CQ	6 dB	25 wpm	1942z 27 Aug
VK3RASA	R4BZ	7017.0	CW CQ	6 dB	26 wpm	1941z 27 Aug
VK3RASA	LZ1KFM	7017.7	CW CQ	24 dB	33 wpm	1938z 27 Aug
VK3RASA	LZ1KFM	7017.7	CW CQ	25 dB	33 wpm	1928z 27 Aug
VK3RASA	4X6FR	7013.9	CW CQ	8 dB	26 wpm	1927z 27 Aug
VK3RASA	RU3X	3507.0	CW CQ	6 dB	20 wpm	1927z 27 Aug



## Regulations & ACMA

### VK Band Plan Review

- RASA continued to meet with ACMA during COVID
- Current topics being considered
- 2x1 Contest Callsigns implemented!
- Licence review
- 1KW for Advanced licensees
- Full access to 50-54MHz for Standard licensees
- Future topics - Regulations
- Syllabus review
- Follow up as required



### RASA Priorities 2021/2022

- Continue to communicate with VK Hams regularly & openly
- Seek feedback
- Education & Awareness on VK regulations & ACMA
- Continue to develop, promote and support QRM Guru
- 1KW for Advanced
- Assist with rollout of 2x1 contest callsigns
- Further develop resources to help FL and newcomers (2021/22)
- WSPR -further rollouts nationally –6m?
- Syllabus review

### Summary

RASA main website: [www.vkradioamateurs.org](http://www.vkradioamateurs.org) and access all our resources

- ☐ Email bulletins sent to all members and clubs
- ☐ RASA Membership is just \$10 a year
- ☐ We want your feedback
- ☐ Visit the RASA website and click on the **Join or Renew** [www.vkradioamateurs.org](http://www.vkradioamateurs.org)

~RASA



# Inside the strange and scammy world of anti-5G accessories

If you're in the market for something to protect you from 5G signals, you've got no shortage of options. Want a hat that will protect your cranium from all those bothersome electromagnetic frequencies while you're out and about? For the low price of just \$55, such a hat can be yours. Need a blanket to ward off invisible 5G radiation while you sleep? That can be had for a mere \$500.

And that's just the beginning. In addition to the aforementioned accessories, Florida-based outfit Defender Shield also sells gear for all your companions — including a \$113 dollar belly band for pregnant women hoping to protect their unborn babies, and a \$125 pet collar that creates an anti-5G force field around your furry friends.

Home / Shop / Clothing / Pregnancy



**Pregnancy EMF Radiation Protection Baby Belly Band**

★★★★★ 21 reviews

**\$89.99 USD**

Create an EMF-free sanctuary for your growing bun-in-the-oven with our soft and stretchy non-toxic Belly Band.

Size: Sm-Med (2-8)

**In stock**

Warranty: 1 Year

- 1 + **ADD TO CART**

Buy with  Pay

**RIGHT SIDE NAVIGATION:**

- All Products
- Cell Phone Cases
- Laptop Shields
- Tablet / iPad Cases
- Headphones
- Blankets
- Active & Travel Gear
- Clothing
- Blue Light Glasses
- For Kids!
- EMF Guide Book

Heck, even if you're not sure what kind of protection you need, a company called Shield Your Body offers 30-minute-long consulting sessions where a "Certified Electromagnetic Radiation Specialist" will assist you in picking out the right equipment — all for the totally reasonable price of just 100 bucks.

As you've probably noticed, these items have a few things in common. First and foremost, they're complete and utter snake oil (more on that later). But in addition to being totally bogus, they also have another thing in common: They're selling like hotcakes.

## The booming business of bogus

"People realize with the addition of more and more wireless devices, the massive push to 5G, and now 5G towers being set up everywhere, the risks associated with electromagnetic radiations are stronger than ever," says Dimitry Serov, the CEO of Aires Tech, a publicly traded Canadian company that sells a broad range of questionably marketed radiation-blocking technologies.



airestech • Follow



**airestech** Lifetune Device and Lifetune Personal modulate electromagnetic radiation, helping protect you from its effects. Those of us who can't live without wireless tech should consider using the combination of these two devices in their everyday lives.

Learn More:  
[www.airestech.com/store](http://www.airestech.com/store)

Peer-reviewed studies and publications proving its effectiveness available here:  
<https://www.airestech.com/technology/>

Stock: CSE:WIFI USOTC:AAIRF

#emr #health #healthylifestyle  
 #wifiradiation #emf  
 #cellphoneradiation



76 likes

AUGUST 12



In September 2020, Aries Tech posted record sales for the third fiscal quarter and made 322% more revenue than it did in the same period the year before. On marketplaces like Amazon, anti-5G devices are flying off the shelves — and accumulating rave reviews in the process. As per Google Trends, searches for “5G EMF [electromagnetic field] protection” have hit breakout levels in recent years, with people looking up that particular query 5,000 percent more in recent years than they did before.

So what gives? Cell phone radiation fears have been around for as long as cell phones have existed, so why is it that these anti-5G products are enjoying such breakout success compared to their 3G and 4G predecessors?

Well, as it turns out, this latest wave of EMF protection profiteering has been a long time in the making, and the folks behind it have been building up for years just to arrive at this moment.

### Keeping it in the family

For the people behind these manufacturers, cashing in on the misguided 5G panic has been something of a long con. Most of them (and their families) have spent much of their lives peddling misinformation and common hoaxes online — though it's unclear whether they're knowingly selling useless products, or they truly and wholeheartedly believe that they're helping protect people from dangerous radiation.

“This stuff [electromagnetic radiation] is harmful,” Shield Your Body’s founder, R Blank, told Digital Trends, “but there’s no way to get rid of it. So there had to be ways of making technology safer. That’s why I started it.”

Blank says he launched a line of “anti-EMF” products after he “experienced” co-writing “Overpowered,” a book on the biological effects of device radiations, with his late father, Dr. Martin Blank, who R calls “the most important EMF scientist in the world.”



## DefenderShield for Kids

EMF Protection for Children & Mothers



EMF radiation affects everyone, but the most vulnerable populations include those with autoimmune disorders or EMF hypersensitivity (EHS), expectant mothers, and children. **Kids, babies, and unborn children** are much more **susceptible** to the effects of EMF radiation, due to their body composition.

[READ MORE](#)

More accurately, though, Martin Blank was one of the most public voices behind the theory that cellular signals are detrimental to humans, and he even urged schools to take precautions while dealing with technology around children. The BioInitiative, a related report he co-authored, is found to be often misused by conspiracy theorists.

In the case of Aires Tech, it's a family affair, too. The company's CEO, Dmitry Serov, told Digital Trends it started as a result of his family's research into the "harmful effects of electromagnetic radiation." His father, Igor Serov, launched a questionable research firm in 1998 called Aires Research, which sought to harmonize the material existence of "animate and inanimate natural objects."

Similarly, DefenderShield's Daniel DeBaun co-authored another reasonably popular book, "Radiation Nation," with his son, Ryan DeBaun, on modern technology's health risks and safety.

"Governments and large organizations are mostly money-driven, and the precautionary principle is not at the top of their priorities," says the elder DeBaun, who claims to have held several executive positions at telecom giants like AT&T and Bell Labs, none of which Digital Trends could find a record of.

The comprehensive efforts to back and propagate the loosely substantiated scientific evidence behind technology's health impact appear to have paid off, as is clear from sales figures. However, how exactly the anti-5G accessories function remains a mystery to everyone except for, apparently, the people buying and selling them.

### Pseudoscience and technobabble

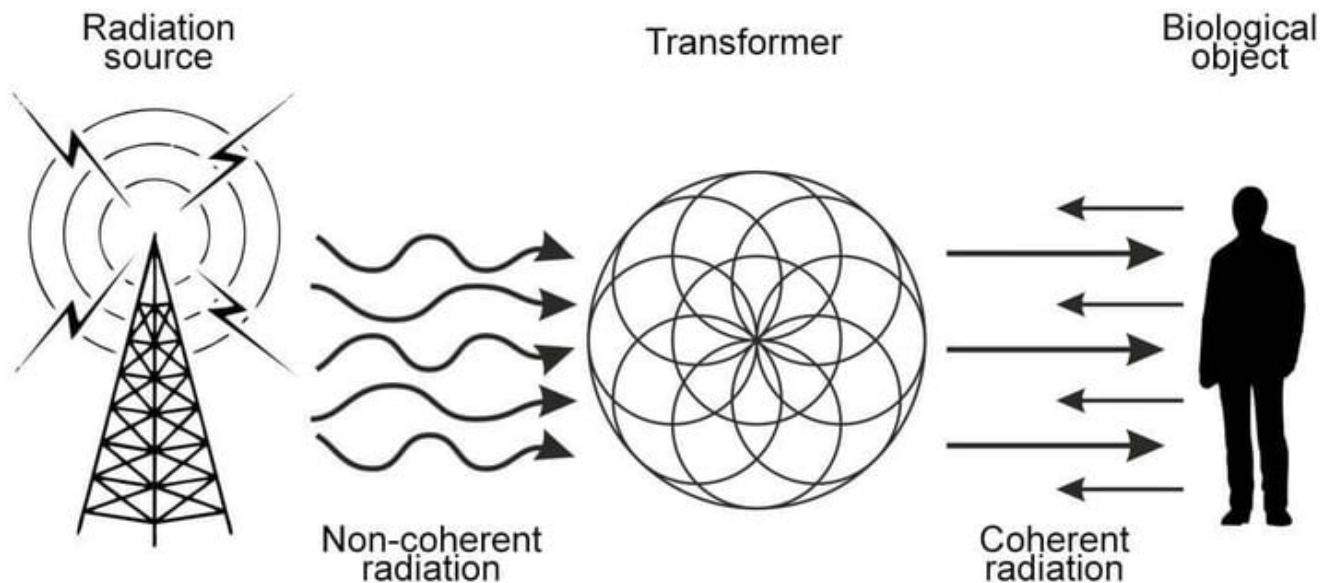
Aires Tech says its tags come equipped with a semiconductor that absorbs charges from the atmosphere to form a hologram. This hologram, Serov claims, restructures and transforms "the EMF haze into a more biologically



compatible form.” DefenderShield and Shield Your Body, on the other hand, told Digital Trends that their products use a combination of “various metals and materials” to block frequencies.

Experts Digital Trends consulted, however, found no evidence to back the efficacy of these products. “These products are elaborate theatrics and completely ineffective,” commented Dr. David Robert Grimes, an assistant professor of biomedical physics at the Dublin City University.

Grimes also discovered an alarming number of “pseudoscience red flags” on Aires Tech’s website and concluded their explanations are “buttressed with technobabble.”



This diagram appears on Aires Tech’s website, on a page explaining how the company’s technology allegedly works

Plus, the Federal Trade Commission (FTC), on multiple occasions, has debunked such devices, labelling them as “cell radiation scams.”

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) confirmed to Digital Trends that there’s no need for shielding accessories as long as proper guidelines are followed. It added that any external attempt to reduce exposure may result in more emitted power, “since the device might think the connection gets worse and thus the effect will be counteracted.”

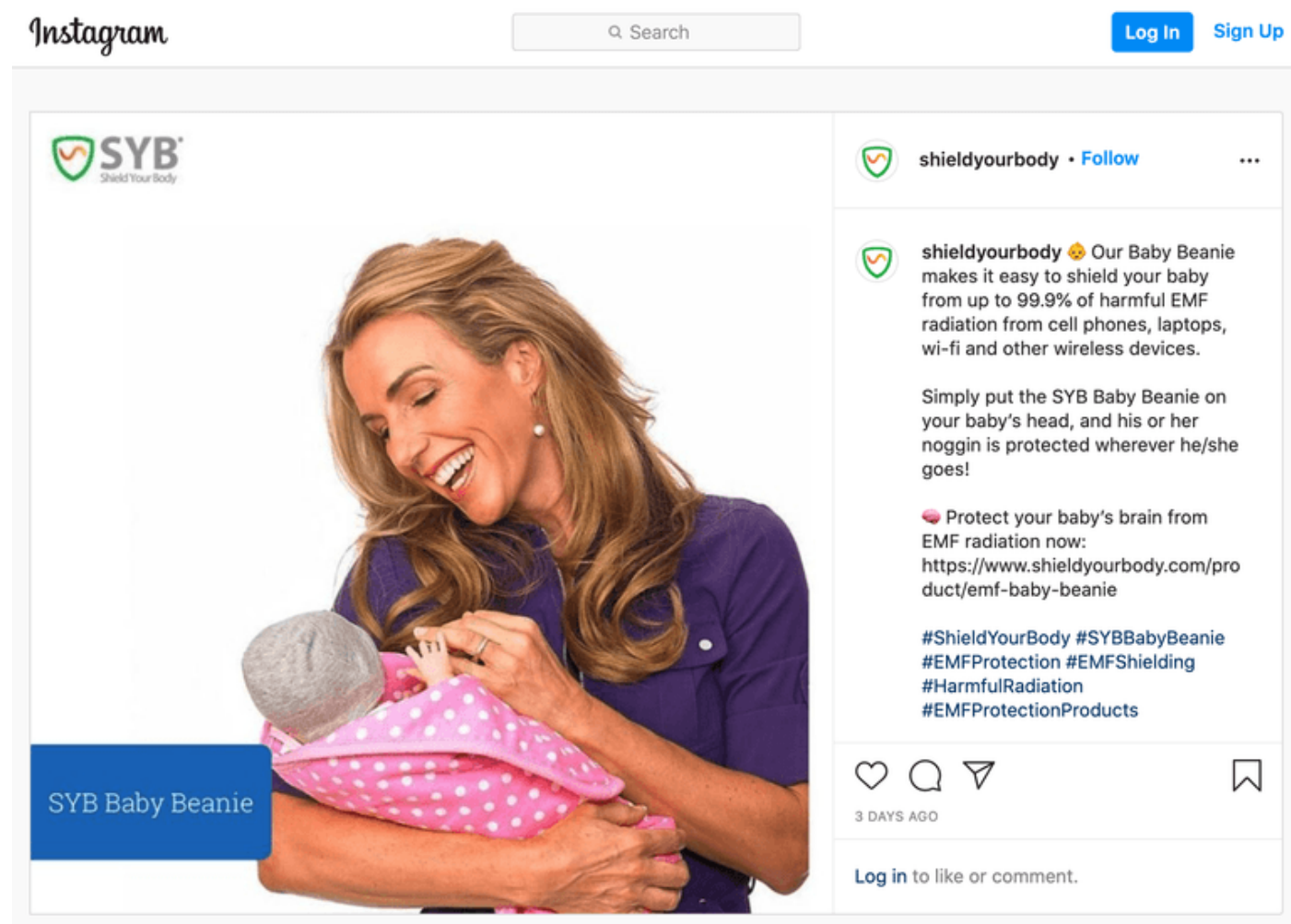
On top of that, reviews performed by Digital Trends found the scientific evidence and studies these companies quote on their websites unreliable and weak. All of Aires Tech’s scientific publications, for instance, have been authored by Igor Serov, its founder, or Andrew Michrowski, who’s on the management board. Shield Your Body’s research papers are either outdated, written by R Blank, or discuss unrelated science, like how cell phone signals hinder sparrows’ ability to navigate in the air.

More importantly, it’s well-established by reputed bodies like the Food and Drug Administration (FDA) and ICNIRP that radiations from your gadgets or network towers are not detrimental to your health, rendering these “anti-5G” devices unnecessary in the first place.

## Blame it on social media

Grimes says the reason these “fringe groups” have continued to flourish, despite warnings from official bodies, is that they’ve become “far more adept at exploiting social media to push their debunked claims, understandably frightening the unwary.”

That’s true on multiple levels, and while social media companies have tried to censor misinformation, they have failed to do it consistently. Even a cursory review of any of these social networks can land you in a flood of posts that sell or promote EMF-protection accessories or other related quackery. On TikTok, for instance, posts tagged with “#emf” have been watched by over 70 million times. This same type of misinformation has recently allowed malicious groups to mislead people into vandalizing 5G network towers.



Recent reports have revealed that most people who believed there’s a link between 5G and COVID-19 get a great deal of their information on the virus from YouTube.

On top of that, Digital Trends discovered that tech giants like Amazon, Facebook, and Google had let sellers, including Aires Tech, run advertisements despite explicit content policies against EMF-shielding products and pseudoscience.

Influencer marketing plays a key role as well. Companies including Aires Tech offer generous affiliate programs that reward people every time someone buys a product from their shared link. In an investor report, Aires Tech said it pays affiliates 10% to 20% commission. Amazon’s affiliate commission, in comparison, ranges from 1% to 9%.

While Amazon, TikTok, and Facebook refused to comment on the topic, a Google spokesperson told Digital Trends that “ad or video content that promotes harmful health claims or ‘miracle cures,’ including claims linking 5G to COVID-19, are a violation of [Google’s] policies. When we find content that violates our policies, we quickly remove it.”

Dr. John Dawson, the deputy head of the Communications Technology research group at England’s University of York, believes that the word “radiation” has become emotive since it’s also associated with activities that are actually harmful to human health, like X-rays. That relation is now being exploited to disseminate hoaxes about 5G and other radio waves on the internet.

But at 5G and mobile levels, he adds, “you might achieve more heating by putting a woolly hat on than using your phone.”

Despite the science so evidently against them, anti-5G sellers have thrived by combining an almost cult like following, the breakneck distribution of social media, and the abundance of e-commerce platforms. And with little to no regulatory oversight, they’ve managed to expand their line of fraudulent products with zero repercussions. As the false 5G narrative continues to gain momentum and the technology arrives in other regions, these accessories’ sales will only soar higher. The question is: Can the facts win out?

*~Internet*

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## NEVARC News The club magazine

All it needs is YOU  
Send stories of your radio news to the editor

What have you been up to in these strange days of COVID?

[magazine@nevarc.org.au](mailto:magazine@nevarc.org.au)



# SIP Phone Story

After the attempted programming saga of November last year, two other SIP Phones were ordered. Postal delays are interesting, for the first time ever I ordered a SIP phone from Amazon USA. The phone got from USA to Sydney in two days, but took another ten days to get delivered from Sydney to me. Another SIP phone was ordered from a Sydney suburb and that took two weeks to arrive, everyone is shopping online due to restrictions, just before Christmas.

## LAST DITCH PROGRAMMING SCCP TO SIP ATTEMPT

With no success programming the first SCCP [Skinny Client Control Protocol] phone to SIP with a Windows PC, a laptop and a Raspberry Pi, I added a hard drive in lieu of my C:\ on my PC and installed Linux Mint, the latest version.

Trying to programme the first SCCP phone with DHCP still refused to work.

One thing I noticed however Linux install is so seamless and every attached device on the PC just works. My earlier version of Linux Mint a few years old only gave me one monitor out of my four; this latest version discovered all four monitors and just installed all the required drivers without even asking what sort of graphics card was in the machine.

Having lots of spare hard drives is handy, multiple operating systems can be played with, just restore the original drive and the PC is back to normal with no risk of dramas during experimentation.



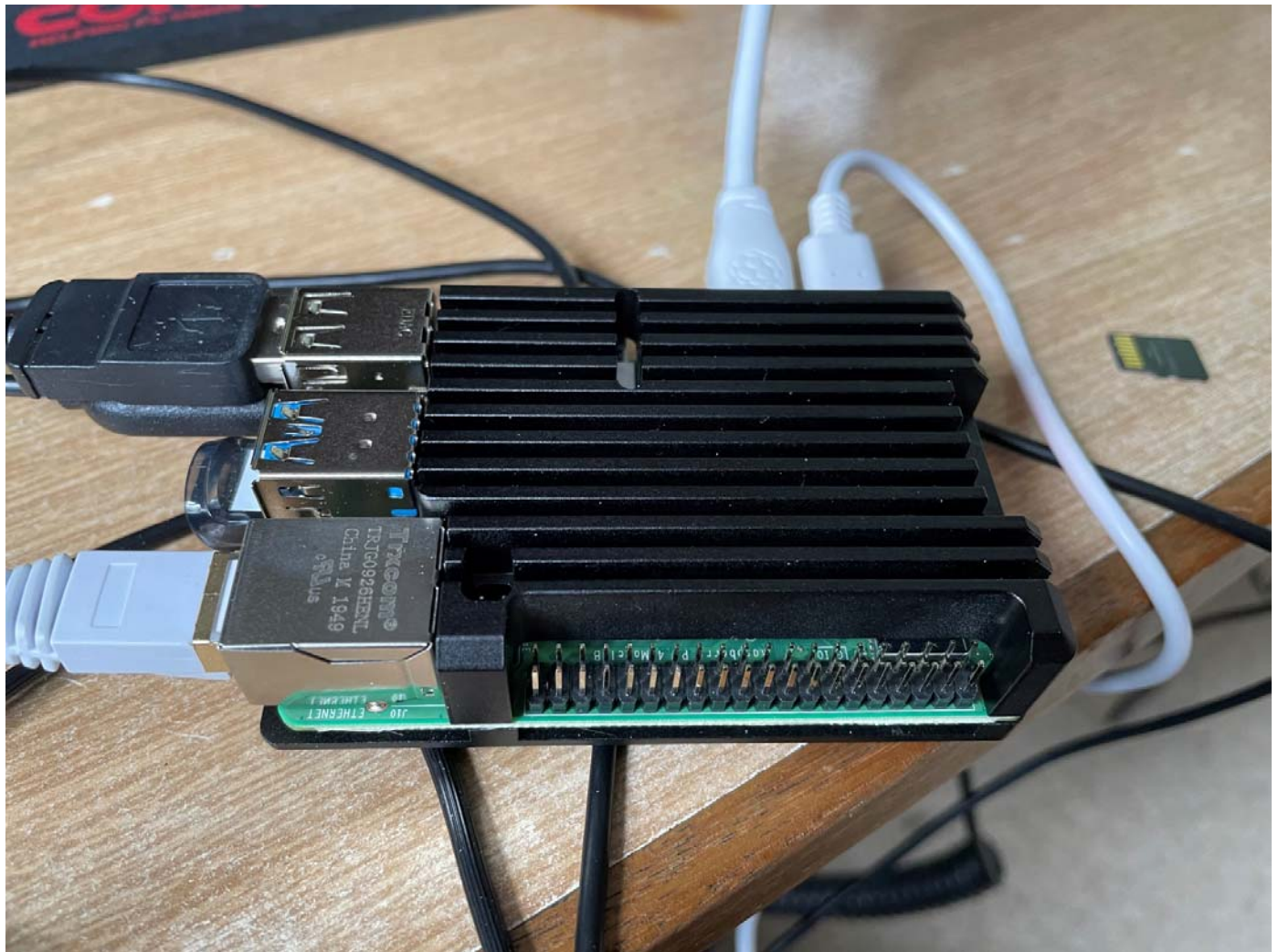
The extra temporary hard drive, with a Linux install, to run DHCP



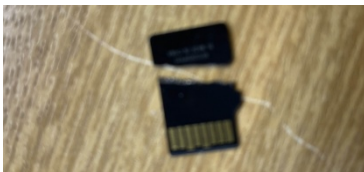


Linux Mint installs discovering all four monitors on the video card





The Raspberry Pi 4, with 4GB Ram, running DHCP, but without success with the SCCP Phone



I managed to break an SD card trying to insert it into the Raspberry Pi  
 Yes, it was the right way around, when I broke it.  
 It was a very thin one; I have noticed the better ones are thicker in size.

SD cards are small, compact and pretty reliable and the price is steadily coming down. There are, however, certain practices that ensure their longevity. But how long do SD cards last for?

An SD card is a solid-state device, meaning it contains no moving parts. This is a huge improvement over older portable storage devices like floppy disks, which had thin, flimsy disks spinning at high speeds. An SD card's components are part of its circuitry, which is why they're so small and compact. Data is stored on flash memory chips that are found on the circuitry. Flash memory is a type of Electronically Erasable Programmable Read Only Memory (EEPROM) chip. There are two main types of memory cell that are used in solid-state devices like SD cards. Many SD cards use single level memory cells that are either on or off. These cells can only store a single value, and as such are fast and reliable. The downside is that you need a lot of them in a big memory card. Multi-level cell chips are found in lower cost SD cards. Each of the cells stores a voltage and the level of the voltage represents a number of different values.

Memory cells are insulated in order to prevent the charge leaking away. However, this insulation is eroded every time a write action is performed. Over time, this can result in the voltage in a cell changing slightly, which can cause the data on the SD card to become corrupted. Most modern SD cards are designed to detect



these problem cells and avoid them, but over time, if there are too many, the card may not have enough memory to map them. The exact lifespan of an SD card depends on a number of factors. Assuming it doesn't physically break first, if you use your card relatively frequently – for example more than once a week – it's a good idea to replace it once a year.

Pinpointing exactly when you replace your SD card is difficult due to the varied pressure people put them under. The chances are that your SD card will physically stop working due to damage before it starts corrupting your data. SD cards are made with cheap components to keep the costs down, and as such, are very prone to breaking.

One thing that SD cards are definitely not suitable for is long term storage, due to the charge in the cells leaking over time. Although there are special SD cards that are designed only to be written to once, and are used for archival purposes, commercially available SD cards like the one you'd use in a camera shouldn't be used like this. Most SD cards won't retain data for more than about five years. The best practice for keeping your data safe is to copy it from your SD card to your computer as soon as you can.

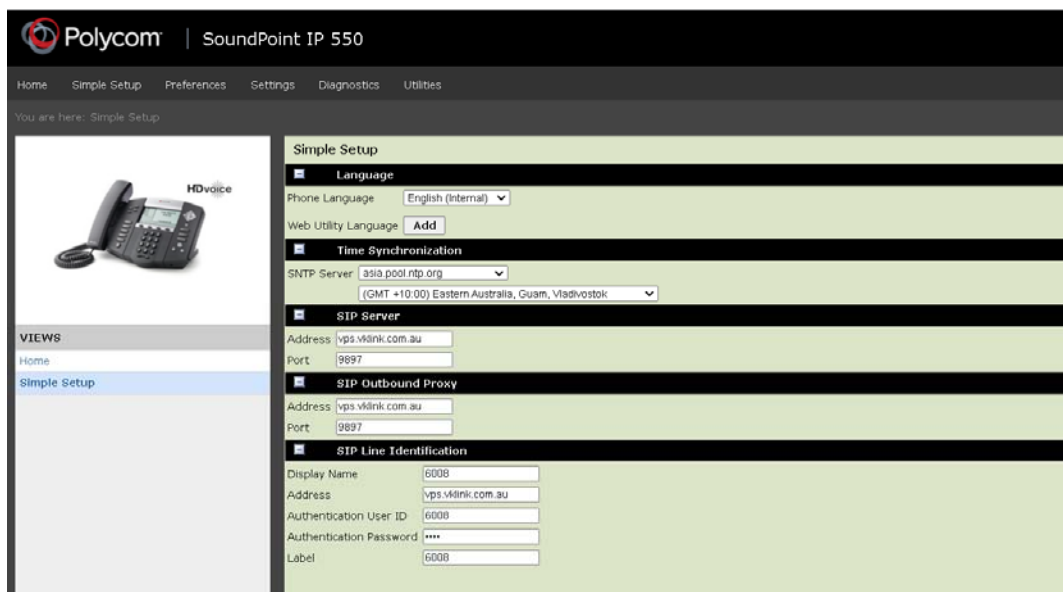
The latest Raspberry Pi 4 now supports booting from a USB Drive, no need for an SD card at all. But USB Drives have a finite lifetime as well, but a bit better than SD cards.

## SETTING UP THE NEW SIP PHONE – POLYCOM-SOUNDPOINT-IP-550 SIP PHONE

The first SIP Phone to arrive in the post was the Polycom 550.

This was easy to setup via a web browser interface.

As soon as it booted up a few minutes later the correct date and time were displayed.

The image is a screenshot of the Polycom SoundPoint IP 550 web interface. The top header shows the Polycom logo and the product name 'SoundPoint IP 550'. Below this is a navigation bar with links: Home, Simple Setup, Preferences, Settings, Diagnostics, and Utilities. A breadcrumb trail indicates 'You are here: Simple Setup'. The main content area is titled 'Simple Setup' and contains several configuration sections. On the left, there is a sidebar with 'VIEWS' including 'Home' and 'Simple Setup' (which is selected). The 'Simple Setup' section includes: 'Language' (Phone Language: English (Internal), Web Utility Language: Add), 'Time Synchronization' (SNTP Server: asia.pool.ntp.org, Time Zone: GMT +10:00 Eastern Australia, Guam, Vladivostok), 'SIP Server' (Address: vps.vlink.com.au, Port: 9897), 'SIP Outbound Proxy' (Address: vps.vlink.com.au, Port: 9897), and 'SIP Line Identification' (Display Name: 6008, Address: vps.vlink.com.au, Authentication User ID: 6008, Authentication Password: \*\*\*\*, Label: 6008). An image of the Polycom HDvoice phone is shown on the left side of the main content area.

But some settings were obviously wrong as I later found out; Matt's server blacklisted me.

Matt said, *"It banned you because you attempted a sip connection 3 times in 60 seconds with incorrect username/password. If it bans you, no email access to NEVARC emails no website access and no phone server access. It is to stop hackers... you know, the ones that gave you a hard time when you were running the website... I have no issues because it kicks you out. Other settings will be trial and error with you."*

So further setting adjustments were tried, with screenshots emailed to Matt, I think I tested his patience. But Matt is very helpful and is determined never to let technology defeat him.

But this SIP Phone refused to register and kept getting me blacklisted, so I decided to scrap this phone. I posted it to Matt, he might get it going, and I have no idea what I am doing wrong with it.

## SETTING UP THE NEW SIP PHONE – H3 HOTEL PHONE

While looking at the documentation for 3CX, one of the recommend SIP Phones was a H3 “Hotel Phone”. Looking online I found it and ordered one. This IP Phone is setup via a web browser so easy.

It is very basic with no screen display, but with all the settings done via a web browser it does not matter.

When you are called you don’t know who is calling you. For amateur radio use I don’t care.

Within minutes the IP Phone was registered on Matt’s system.

I printed out the settings and copied all to a CD so these details were not lost.

After this phone was registered on the system, I read through the settings and applied the same settings to the other SIP Phone, the Aastra 6731i.

As soon as the updated settings were in the Aastra 6731i, it too registered.

Now I had two SIP Phones working.



After calling the Sip Phones from the virtual SIP Phones on the PC, Zopier5, all was working, both inbound and outbound calling, with all the smart technology Matt’s end functioning as the telephone exchange. I emailed Matt the good news.

Line: SIP 1

Basic Settings >>

Line Status	Registered	Activate	<input checked="" type="checkbox"/>
Username	6008	Authentication Name	6008
Display name	6008	Authentication Password	.....
Realm		Server Name	vps.vklink.com.au
<b>SIP Server 1</b>		<b>SIP Server 2</b>	
Register Address	vps.vklink.com.au	Register Address	
Register Port	9897	Register Port	5060
Transportation Protocol	UDP	Transportation Protocol	UDP
Registration Expiration	600 Second	Registration Expiration	3600 Second
Proxy Server Address		Backup Proxy Server Address	
Proxy Server Port	9897	Backup Proxy Server Port	5060
Authentication Name			
Authentication Password			

The H3 settings via the web browser, with that lovely word, “Registered” in red

## SETTING UP THE NEW SIP PHONE – AASTRA 6731i

### The web interface to enter all settings

The screenshot shows the Mitel 6731i web interface in a browser window. The address bar shows '192.168.0.8/globalSIPSettings.html'. The interface has a blue header with the Mitel logo and '6731i' in the top right corner. A left sidebar contains a navigation menu with categories: Status, Operation, Basic Settings, and Advanced Settings. The main content area is titled 'Global SIP Settings' and is divided into three sections: Basic SIP Authentication Settings, Basic SIP Network Settings, and Advanced SIP Settings. Each section contains various configuration fields with input boxes and dropdown menus.

Basic SIP Authentication Settings	
Screen Name	6007
Screen Name 2	
Phone Number	6007
Caller ID	6007
Authentication Name	6007
Password	*****
BLA Number	
Line Mode	Generic
Call Waiting	<input type="checkbox"/> Enabled

Basic SIP Network Settings	
Proxy Server	vps.vklink.com.au
Proxy Port	9897
Backup Proxy Server	0.0.0.0
Backup Proxy Port	0
Outbound Proxy Server	vps.vklink.com.au
Outbound Proxy Port	9897
Backup Outbound Proxy Server	0.0.0.0
Backup Outbound Proxy Port	0
Registrar Server	vps.vklink.com.au
Registrar Port	9897
Backup Registrar Server	0.0.0.0
Backup Registrar Port	0
Registration Period	600
Conference Server URI	

Advanced SIP Settings	
Explicit MMI Subscription	<input type="checkbox"/> Enabled
Explicit MMI Subscription Period	96400
MMI for BLA account	<input type="checkbox"/> Enabled
AS-Feature-Event Subscription	<input type="checkbox"/> Enabled
AS-Feature-Event Subscription Period	3600



This was the fastest IP Phone to setup, all done via a web interface. So I thought – more later!

I like the display screen as you know who you are connected to.

It displays the time, updated via a time server.

Also you know you are successfully connected to the NEVARC repeater as the connected timer is displayed.

If another SIP Phone on the VKLink network calls you their number is also displayed.

You can either talk on the repeater via the handset, but I can use hands free on all the SIP Phones.

To be heard properly you need to use the handset.

As mentioned, using the keypad \* and # to key up and un-key the connected repeater is easier than using a mouse with a virtual SIP computer phone.

So two physical SIP Phones will do one in the shack and the other can be used on the rear deck. The phone is only taken outside when in use so the weather does not destroy it.

A cheap run of Ethernet cable from the shack to rear deck completed the installation.



## TESTING THE TWO SIP PHONES TO NEVARC REPEATERS

As both SIP Phones require power, this is provided as POE [Power over Ethernet]

I don't have a POE switch so I use an individual POE adapter.

Now that the second IP Phone is working a second POE adapter was purchased.



Power over Ethernet adapter on the floor

All the extra cables for the SIP Phones will need to be tidied up now that everything is working

After running yet another Ethernet cable under the house to the rear deck, the other SIP Phone can connect to the NEVARC repeaters and I can chat during the summer hours, unless the mozzies decide to snack on me.

Another handy thing is I can connect to a repeater and then just let the phone monitor it all day long.

No need to have a PC running all the time with virtual phone software.

If someone on Matt's VKLink network calls me and I miss the call, the SIP Phone will display the caller details and time of the missed call, with the option to call back.

The other basic SIP Phone without a screen does not offer that of course.

### SIP Phone Number Allocation – VK3CH

6005 Shack Computer Virtual SIP Phone – Zopier5 – only when activated

6006 iPhone – Zopier5 – only when activated

**6007** Shack SIP Phone – 24 Hours – Primary with screen display of connected call and call history

6008 Shack SIP Phone – 24 Hours – Secondary with screen display of connected call and call history

### Repeater Status Webpage

<https://status.vklink.com.au/>

Node	Uptime	Idle	Info, Click for more info	Connected to
1000	38	928:42	VKLink Master	
1202	37	2:1	VK2RWD 146.700 -600 Goombargana NSW	
1210	0	0:0	VK2RWD 29.660Mhz -100khz Goombargana TX Site	1310
1215	29	55:3	VK2RBL 146.725MHz Balranald, SW NSW	
1300	38	928:46	VKLink Victorian Hub - Location Wodonga	
1301	38	928:42	NEVARC Linked Repeaters - VK2RWD, VK3RWO, VK3RWC	
1302	37	900:13	VK3RWO 146.975- 123hz CT Wodonga	
1310	0	0:0	VK2RWD 29.560Mhz Goombargana RX Site	1210
1312	38	5:59	VK3RWC 147.325Mhz -1.6Mhz offset 123hz CT Wangaratta	
1340	26	1:14	VK3RMA 146.800MHz, Mildura, NW Victoria	
1341	1	25:15	VK3RSH 146.900MHz, Swan Hill, NW Victoria.	
1720	13	320:1	VK7HH Experimental VKLink Node	
1727	2	0:0	VK7RTC 439.825MHz, Mt.Wellington VOTER/Simulcast Repeater	1752
1752	8	0:0	VK7RAA 147.000MHz, Mt Arthur, Permanent N-S Link	1727,50423

## MORE STRANGE THINGS THAT ENDED UP BEING MY FAULT

One thing I noticed at times was I could call one phone to another at home via Matt's system, but some days it would not work, or say busy when it was not, or fail with dial tone.

A few days alter Matt told me he had a look at the logs.

There are 20 RTP Ports [Real-time Transport Protocol] available, every phone call uses two.

If they are not released at the end of the call it is 600 seconds [10 minutes] before they are dropped.

So when I was playing with phone calls I was using up RTP Ports until there were none left.

This explained why I could not make a call – after the RTP Port allocation had been used up by me.

Matt has since increased the RTP Ports to 10,000.

He told me not to take up the challenge to tie up all 10,000 of them!

Matt said when there only a few SIP Phones on the system 20 RTP Ports was enough.

With the extra and growing SIP Phone population it was only a matter of time extra RTP Ports were needed.

Sorry Matt... mea culpa.

## CODEC DRAMAS WITH AASTRA 6731i

It was not until I actually tried a contact to the repeater that I found the Aastra phone had no sound sent.

But it worked fine phone to phone.

Matt told me that the repeaters only used a voice codec of G.726

I looked at the settings of my working H3 phone, compared to the Aastra phone settings, nothing immediately apparent wrong could be seen.

So I made a Codec comparison chart – green is working into repeaters and red is failing to work repeaters.

Voice Codec	H3 SIP Phone	Aastra 6731i SIP Phone	Zopier5 Virtual PC Phone
G.722	✓	✓	✓
G.711 U	✓	✓	✓
G.711 A	✓	✓	✓
G.729 AB	✓		
G.726-32	✓	✓	
G.723-1	✓		
OPUS/800			✓
OPUS/16000			✓
GSM-FR			✓

More testing showed the Aastra phone can dial into the repeater, as the connected timer starts on the phone display and I can hear the repeater Morse ID and persons talking on the repeater.

But when I press \* to talk others say they don't hear the repeater key up.

Perhaps with no audio passed, there is no audio to trigger the repeater into action.

Looking at the chart the Aastra 6731i does not have all of the versions of voice codec of G.726 to choose from. The software version recommended by 3CX is version 3.3.1.4305, which was what the phone had.

I thought a software upgrade was the way to go.

Aastra firmware files were found on the internet and copied to the PC.

To load firmware on the phone the 1 & # keys have to be pressed and held down during power up.

The words of 'web recovery at x.x.x.x' [the IP address of the phone] is displayed on the phone screen.

I followed the instructions on the internet, but they did not work, either the methods of HTTP / FTP / TFTP.

Now the phone was in an upgrade booting loop.

The only way out of that was to complete a successful file transfer via HTTP / FTP / TFTP.

I spat the dummy and gave up for the day.

## CODEC TECHNICAL INFO

A codec, which stands for coder-decoder, converts an audio signal (your voice) into compressed digital form for transmission (VoIP) and then back into an uncompressed audio signal for replay. It's the essence of VoIP. Codecs vary in the sound quality, the bandwidth required, the computational requirements, etc.

Each service, program, phone, gateway, etc., typically supports several different codecs, and when talking to each other, negotiate which codec they will use.

Little Known Fact – You can assign a different codec to individual phones. You could use medium quality/low bandwidth G.729 codec, or use the superior quality/heavy bandwidth G.722 codec.

### Common VoIP Codec Protocols

G.729 is a codec that has low bandwidth requirements but provides good audio quality. This is the most commonly used codec in VoIP calling.

G.711 is a codec that was introduced by ITU in 1972 for use in digital telephony. With only a 1:2 compression and a 64K bit rate for each direction (128K plus some overhead), it is best used where there is a lot of bandwidth available.

G.722 is a high bit rate (48/56/64Kbps) ITU standard codec which, because it is of even better quality of the traditional public switched telephone network (PSTN), it can be used for a variety of higher quality speech applications. This standard also requires an adequate amount of bandwidth.

End user devices, such as IP phones and soft phones, typically support several different audio codecs. When two of these devices begin to talk with each other, they will negotiate which codec to use by looking at which ones they have in common.

You can think of codecs as the different types of audio files on your computer. Just as a .wav player would not be able to play an .mp4, an IP phone would not be able to successfully communicate with another end user device if they did not share at least one codec.

### G.726 Overview – Protocol chosen by Matt for input to NEVARC Repeaters

G.726 is an ADPCM [Adaptive differential pulse-code modulation] speech codec for the transmission of voice at rates of 16, 24, 32, and 40 kilo-bit/s. G.721 and G.723 had been folded into G.726.

Its benefits is it uses 32 Kilo-bits which is half the rate of G.711 codec and hence increasing the usable network capacity by 100% it is very much used on international trunks in the phone network.

Its cons are it is not well-suited to music or sound effects, but we are not using that mode in Amateur Radio.

One method of evaluating audio codecs is the Mean Opinion Score (MOS).

To get the score, groups of people listen to call samples and rank each based on the clarity of speech. The scale ranges from 1 to 5. A proper MOS study includes words that sound similar to one another. The listeners also eavesdrop from different locations and devices.

Codec G.726 has an average MOS of 3.85

When I hear the SIP Phones into the repeater the voice quality in my opinion is very good, you can tell when a SIP Phone is talking over the repeater compared to a radio transmitting into the repeater.



## SIP PROTOCOL EXPLAINED

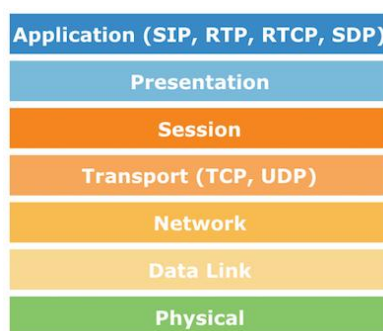
A protocol is a set of rules that defines how two or more computing devices (laptops, smart phones, routers, network switches, etc.) communicate with each other.

SIP is a media-independent protocol—it's not voice, it's not video, it's not data—it could be anything. While it's mostly applied to VoIP, it's not a VoIP protocol.

The session initiation protocol (SIP), a popular internet telephony protocol, forms the foundation of all types of internet communication sessions. It establishes sessions, manages signalling, and terminates the connection when the sessions end. It is important to remember that VoIP isn't a protocol itself. Instead, it's an umbrella term for all the technologies involved in transporting voice and video information using Internet Protocols.

VoIP is a family of technologies that all support sending or receiving voice messages over the internet. SIP is an application protocol used to carry all forms of digital media, including voice messages—so SIP is a specific technology that supports VoIP calls.

Communication between networked devices on the internet doesn't just involve a single protocol. Multiple protocols work simultaneously by building on top of each other in layers, collectively known as a "protocol stack." Different models explain how protocols layer on top of each other, but the Open Systems Interconnection (OSI) model, developed by the International Organization for Standardization (ISO), is the most commonly used.



SIP simply initiates and terminates an IP communication session, which could be a voice call between two people or a video conference between a team. It sets up the session by sending messages—in the form of data packets—between two or more identified IP endpoints, also known as SIP addresses. Every SIP address is linked to a physical SIP client (e.g., an IP desk phone) or a software client (e.g., a soft phone).

SIP doesn't encode, decode, or transport any information during these sessions. That's why it can be used for video conferencing and instant messaging as well as making phone calls over the internet. We'll leave the other uses of SIP aside for now and focus on how the protocol works during a voice call.

SIP doesn't work alone during VoIP calls. Several other protocols work along with it to ensure voice data reaches its destination. The session description protocol (SDP) is one such protocol.

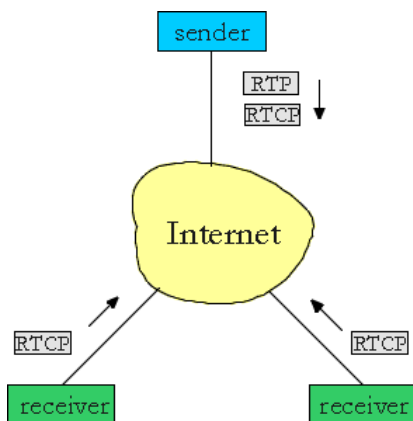
While SIP communicates with IP endpoints to exchange signalling details, SDP conveys session-related information to help participants join or receive details of the session. It sends three types of information: session description, time description, and media description. SDP doesn't transport these details itself. Instead, session descriptions are included as a payload of SIP messages.

Before being transported over the network, voice information is encoded using codecs that translate audio signals into binary data. Many codecs are used for this purpose.

Encoded packets of audio data are carried by the real-time transport protocol (RTP), a specialized application layer protocol used for real-time streaming of audio and video data. RTP sessions are independent of SIP. RTP sessions run parallel to SIP sessions, unlike SDP, which is a payload of SIP.

RTP works alongside the RTP control protocol (RTCP), which exchanges information related to service quality, including the number of data packets exchanged, number of packets lost, and round-trip lag time. Using RTCP details, the service quality of sessions can be monitored. RTCP information isn't mixed with the RTP data stream and is delivered through separate sessions that run parallel to the RTP streams.

The image depicts the exchange of RTP and RTCP data packets in a VoIP session with three participants.



RTP, RTCP, and SIP (with the SDP payload) data packets are transported to their destinations using transport layer protocols. The two most commonly used protocols are explained below.

Transmission control protocol (TCP):

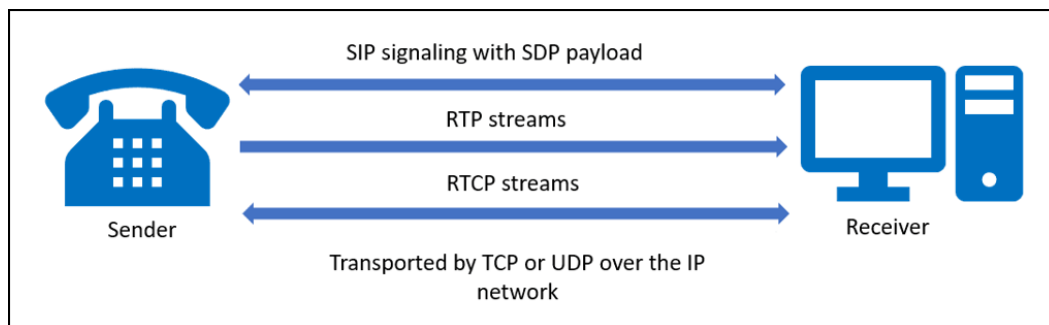
Transports packets in an ordered sequence. For every packet sent, the receiving end sends back a receipt acknowledgment packet. If the acknowledgment packet isn't received within a certain time or if it states that there was a problem, then the original packet is re-sent. TCP is designed for accuracy and ensures data packets are delivered in their original sequence.

User datagram protocol (UDP):

Transports data without detecting out-of-sequence packets or retransmitting lost packets.

Packets can not only be delivered in an incorrect order but can also be completely left out. The main aim of UDP is to get the packets delivered to their destination as soon as possible.

Given its focus on real-time data transmission, UDP is more suitable for VoIP calls than TCP. Although lost and out-of-sequence packets in UDP can cause slight audio quality issues, in many cases these aren't detected by the human ear. Also, the delay caused by the reordering and retransmitting of TCP packets can result in poor audio quality or even dropped calls.



Framework of a VoIP call between two endpoints

## RASPBERRY PI 4 TO THE RESCUE TO PROVISION THE AASTRA SIP PHONE

After a few days I decided to try using an FTP Sever on a Raspberry Pi to provision the Aastra phone.

Installing an FTP Server on a Raspberry Pi is easy, lots of instructions on the internet.

Run `sudo raspi-config`, you need SSH enabled.

Then install the FTP Server with `sudo apt install vsftpd`.

Then you create the files to store the files, `sudo -p /home/pi/FTP/files`

To log into the Raspberry Pi,

Host	The IP address of your Raspberry Pi
Username	pi
Password	whatever you setup
Port	21

The standard path to the FTP files on the Raspberry Pi is \FTP\files

Firmware Version 3.2.2.31093 was selected.

The firmware files are always named 6731i.st

After upgrading the firmware I now had more Codecs including many versions of the required G.726

Aastra 6731i Updated Codec List after Firmware upgrade

Voice Codec
G.722
G.711 U
G.711 A
G.729 AB
G.726-32
G.723-1
G.726-16
G.726-24
G.726-32
G.726-40

FTP Settings

Filename	6731i.st
Upgrade Type	Firmware
Download Protocol	FTP
TFTP Server	
TFTP Path	
FTP Server	192.168.0.x
FTP Path	\FTP\files
FTP User Name	pi
FTP Password	-THE PI PASSWORD-
HTTP Server	
HTTP Path	

After the phone did the FTP download and eventual reboot I had an upgraded phone.

All the login settings for Matt's system had to be re-typed in.

The phone logged back on to Matt's system in seconds.

I did a call between my two SIP phones in the shack, it worked, perfect audio each way.

I then connected to the repeater with the working phone and listened on the Aastra phone.

The repeater was heard perfectly.

Now the real test; connecting to the repeater, using the Aastra phone.

It connected as it used to, now the voice test – success.

I heard both my voice on TX and the repeater ID on RX on the Aastra phone.

I sent an SMS of the happy results to Matt.



## A PRIVATE BRANCH EXCHANGE [PBX] WITH 3CX, ON A RASPBERRY PI 4

A few months ago, driven by lockdown boredom, I had a play with a Raspberry Pi4 PBX. Software by 3CX is available completely free for home use. The install takes about 5 minutes and is virtually automatic, with just a few details to enter.

You will need A Raspberry PI 4 B4 or B8 with a 32+GB Class 10 Micro SDHC. Also a Raspberry Pi-compatible 2.5 Amp Micro USB power supply and you want to ensure the device has a good casing that allows for maximum cooling.

All the installation details are here <https://www.3cx.com/docs/installing-pbx-raspberry-pi/>

Setting up mobile phones to call via WiFi using 3CX for free was installed in literally seconds by scanning a QR code on the computer monitor with the mobile phone camera. I had a bit of a play with that for a few weeks, very easy to setup and use. Before I locked up the other Aastra phone, I could call between the two, transfer calls, put calls on hold, all sorts of stuff.

3CX give you a full blown PBX for free on a Raspberry Pi, if you need a real intelligent intercom system for your house, use this. Trying to setup a trunk line with 3CX to dial into Matt's system could be done, but no point going to all that trouble when the H3 phone and PC phone work direct into his system.

### On the Wednesday Night 2 Meter Net

I used to use the SIP Phone hands free, but users on the repeater say I sound better talking into the handset  
Repeater users are received with clear sound, either through the handset or hands free



So the last job is to tidy up all the new SIP Phone Ethernet cables off the floor and make it all neat under the table. Much thanks to Matt for putting up with all my emailed SIP telephony questions.

But, I decided on expanding things further... so making things tidy on the floor was delayed.

## A COMPLETE CORPORATE HOUSE PHONE SYSTEM

After the success of upgrading and programming the Aastra phones to do what I wanted, it appeared these were a trusted phone of choice should the phone network ever to grow.

I found five of them on EBay very cheap, located in Sydney, so an order was put in.

This meant that the house would have seven SIP phones in total.

These phones come with a display panel, so you can see the number connected and call status.

To save the expense of powering each phone individually an 8 port POE switch was also ordered.

An 8 port POE switch is not common to find, most switches offer 4 powered ports along with non powered ports. At least this meant that a common feed for both power and data would be located in the shack.

The unit ordered was a 9-Port 10/100Mbps Desktop Switch with 8-Port PoE+.

An External Power Supply gives power with an External Power Adapter (Output: 53.5VDC / 1.3A)

Power Supply is 65 Watts total, so about 8 watts per port.



Looks like more Ethernet cable runs underneath the house.

This unit specifies 100 meters of Ethernet cable run, far more than I require.

Things have sure progressed since the old tin can telephone days.

## MORE SIP ACCOUNTS REQUIRED

I sent a request off to Matt for more SIP accounts for the extra SIP Phones.

At least Matt's accounts are free, both in issue and use.

But the SIP traffic will only be to the NEVARC repeaters or phone to phone.

## DUAL LINE AVAILABILITY – HOST A CONFERENCE CALL

While playing with the Aastra phones I discovered they register two lines on the same number.

So you can be on a call and accept another call your phone and either hang up and take the call, or put the other chat on hold, or host three way conferences with the two incoming calls.

Mate, it's just like being in an office, very professional.

## SIP PHONE PREFERENCE SETTINGS

Delving deep into the settings I found lots that can be user selected.  
Out of the box the phones sound like USA phones in ringing and dial tones.

An Australian setting was found but I wondered if the XYL may get confused when the SIP Phones ring and she thinks it's a call to the actual landline house phone.  
The phones have a selection of ringing tones so I selected one that sounded totally different to the house line.  
Not that the SIP Phones are going to be getting many calls, but at least they won't be annoying telemarketers!

The one setting, the time zone, was a bit unclear at first. I tried to find the time zone setting via the web browser, but that only gave a choice of time servers.  
The actual time zone is set on the phone itself via a key menu, showing the time and date.  
You can even have automatic daylight savings correction and will update as required, no need to remember to change the settings.

Just about every electronic consumer device has an inbuilt clock.  
At least with a time server to calibrate it, the phone will always be accurate synchronized.

## SETTING UP THE NEW HOUSE PHONE SYSTEM

Firstly I must tell you; upon seeing what I was doing the XYL suggested I was somewhat insane and that the house did not need a corporate phone system.  
I blamed COVID lockdown for sending me stir crazy and I needed a technical outlet to pass the time.  
She countered that by saying correctly that lockdowns were over and I was free to roam.  
Still there are worse and far more expensive things I could get into, so she does not complain for long.

To ensure everything worked I wiped all the new phones with a factory reset that had the Codec G.726 to access the repeaters. I let DHCP allocate an IP address to each phone.

Next job was a phone number allocation. The phones can be set to display the number or text to show its use.  
As they are all amateur radio use I just used the SIP allocated extension number for each phone.  
A handy use with two phones in one location is to be able to monitor two repeaters in real time.

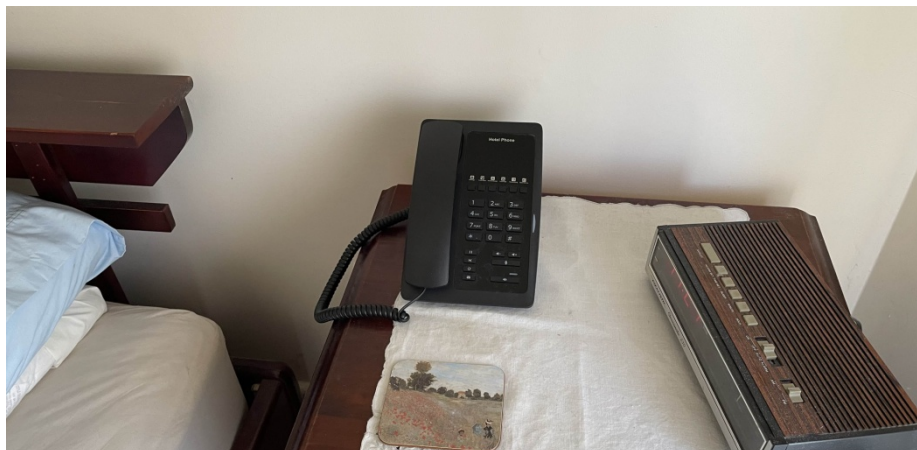
To avoid confusion I later put the SIP Phones back to US settings, so the ringing was not mistaken for the house landline phone.



While running extra Ethernet cables, all the other HDMI and SIP Phone cables were routed neatly off the floor  
Now the carpet can be vacuumed without knocking cables, keeps the XYL happy



New Powered 8 Port Switch powers all the SIP Phones which save POE adapters and cables off the floor.



SIP Phone in the bedroom

Primary & Secondary SIP Phones on the table, with a third under test, left of the printer above







Outside on the Net, in the cool of the evening, until the mosquitoes come and carry me away

**THE FINAL UPDATED SIP PHONE DIRECTORY**

Number	Location
6005	Virtual SIP Phone – Zoiper5 – Shack Office Computer
6006	Virtual SIP Phone – Zoiper5 – iPhone 12 – Portable
6007	SIP Phone – Radio Room Table – Primary [1] Line
6008	SIP Phone – Radio Room Table – Secondary [2] Line
6011	SIP Phone – Bedside Table
6012	SIP Phone – Rear Yard Deck – Temporary use as required, else stored inside
6013	SIP Phone – Radio Room Table – Tertiary [3] Line
6014	Future - Reserved
6015	SIP Phone – Portable, taken when travelling, to dial in when away from home, via internet

I have invested much time, energy and persistence but have learned a lot.

The biggest job was crawling under the house [again] to run more Ethernet cables for the new SIP phones.

But I found a way around that, using a long 2 meter vertical as a runner instead of me crawling under the house. This only works on the distances that are short enough from the point in the shack where the cables leave under the floor, but I have even done coax this way.



## RUNNING CABLES UNDERNEATH THE HOUSE REMOTELY

This method keeps my clothes clean and the XYL happy.



Ethernet SIP Phone cable outside ready to run



Ethernet attached to the white vertical

Vertical with Ethernet pushed under house



Ethernet poking through the other side under deck







Then pushed through under the deck



Other end right under the table on the deck

The completed Ethernet cable to the phone, all working, cable run in 20 minutes, all without hurting my back  
As the weather would eventually damage the phone, it will only be taken outside when in use



A direct call to the XYL outside on the deck, confirmed the Ethernet cable did not get nicked or damaged during the run pull through, the flimsy RJ45 locking tab was also protected by electrical tape. This is the thing I always think is going to be damaged whenever you deal with pulling Ethernet through anything like walls or through conduit pipes, with lots of other existing cables.

The last two SIP Phones were setup, now that Matt gave me some extra SIP lines.

While testing on the Net, Matt was able to talk to me simultaneously while I was on the repeater.

I have since worked out the repeater SIP Phone like mine has two lines, so it can cope with two connections.

I proved it at home by dialling in to the repeater with two separate SIP Phones and I could talk at the same time with either phone. Sure to confuse those listening to the repeater!

So I hope more of you check in to the weekly Wednesday night 8.00pm Net, as I have a choice of SIP Phones to chat to you on, either in the shack or outside with the BBQ.

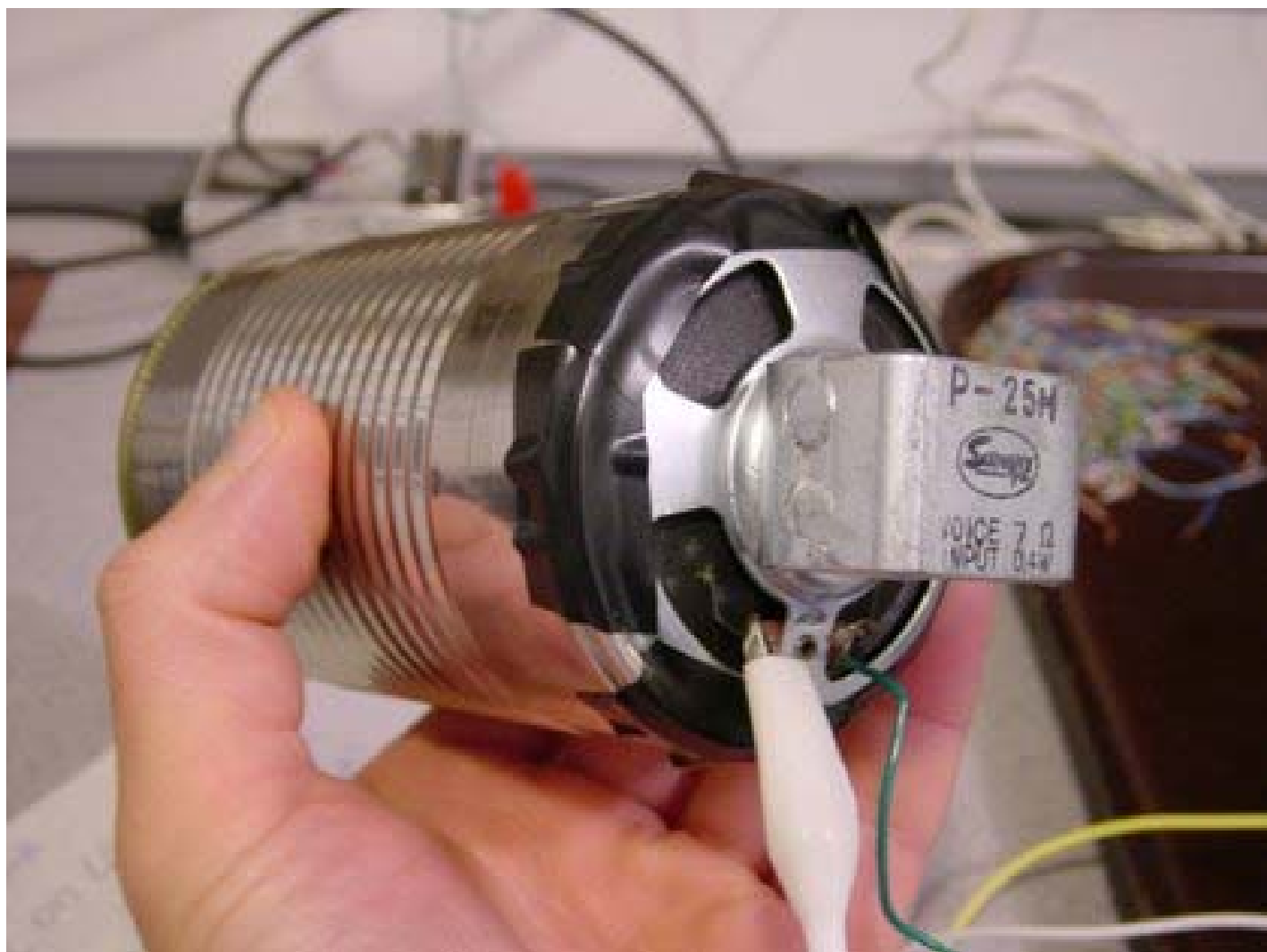
Matt's clever designed VKLink system, keeps folk like me in Melbourne, local 'on air' to the NEVARC club.

Roll on summer... BBQ, Beer and Ham Radio...

*~Mick VK3CH*

# Voice powered crystal controlled radio transmitter

Here is a radio transmitter that doesn't require any power source.  
Well, at least not any classic power source, like batteries.



This radio transmitter is powered by the operator's voice alone.

The speaker connected to the device converts audio signal to low voltage at the end contacts.

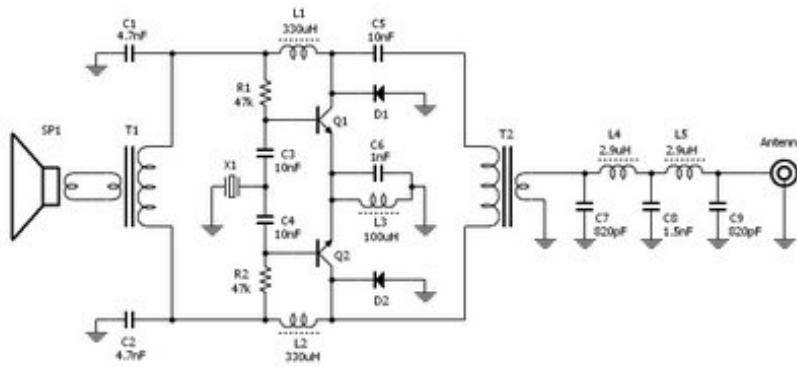
Naturally, amplitude of the generated voltage corresponds to the amplitude of the speaker's voice, hence making this an amplitude modulated power source.

This power source is used to power the high-level DSB modulator/crystal-controlled RF oscillator.  
The interesting part is that the range of this transmitter is around 160km/100miles!

El Silbo is a CW affair, so you should bone up on your Morse Code a bit before building one.

Like many QRP transmitters El Silbo's circuit is rather simple. A junk box loudspeaker is installed at the bottom of the can to convert voice power to electrical power. The signal is passed through a step up transformer, and used to excite a 75m crystal. Two NPN transistors (in this case MPS6521) pass the signal on through a second transformer. The signal is then routed through an LC network to the antenna.





SP1: Junkbox PM loudspeaker; 7 Ohm, 400mW  
T1: Audio transformer; 8 to 1200 Ohms  
X1: 75m quartz crystal  
Q1, Q2: MPS6521 (junkbox finds)  
D1, D2: Germanium signal diodes (1N34a, etc.)  
T2: 9 to 1 impedance step-down transformer (Minicircuits T9-1, etc.)  
L1, L2, L3: Molded RF chokes

El Silbo  
Voice-Powered 75m DSB Transmitter  
de AA1TJ  
10/22/09

~Internet

## What's a long length of LAN cable?

A transmitter, of course.

LAN cables can be sniffed to reveal network traffic with a \$30 setup, says researcher.

An Israeli researcher has demonstrated that LAN cables' radio frequency emissions can be read by using a \$30 off-the-shelf setup, potentially opening the door to fully developed cable-sniffing attacks.

Mordechai Guri of Israel's Ben Gurion University of the Negev described the disarmingly simple technique, which consists of putting an ordinary radio antenna up to four metres from a category 6A Ethernet cable and using off-the-shelf software defined radio (SDR) to listen around 250MHz.

"From an engineering perspective, these cables can be used as antennas and used for RF transmission to attack the air-gap," said Guri. He added that his setup's \$1 antenna was a big limiting factor and that specialised antennas could well reach "tens of metres" of range.

The research shows that poorly shielded cables have the potential to leak information which system administrators may have believed were secure or otherwise air-gapped from the outside world.

~WIA News

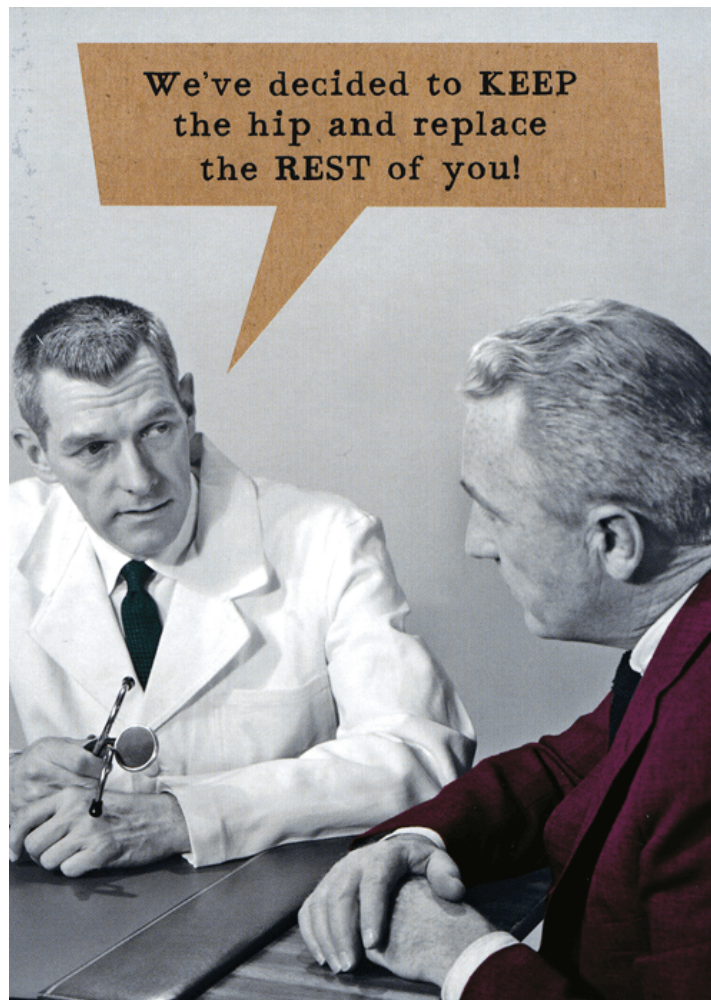
### Adding SOS and PAN to Restricted callsign list

The ACMA is proposing to add callsign suffixes SOS and PAN to the list of reserved callsigns. Because SOS and PAN are internationally recognised distress and urgency signals, there is a risk that use of these suffixes as part of an amateur radio callsign could be confused with emergency calls. Under the proposal, amateur radio operators who have already been allocated callsigns with these suffixes will not be required to return their callsign.

### Update to Advanced Syllabus

The ACMA is proposing to update Amateur Operator's Certificate of Proficiency – Advanced Syllabus by adopting the syllabus in CEPT ECC Recommendation T/R 61-02 Harmonised Amateur Radio Examination Certificate (HAREC). The ACMA is aware that the Advanced Syllabus is out of date. The Certificate of Proficiency – Advanced issued by the AMC states that the holder of the certificate has passed an examination that meets the requirements described in HAREC. For this statement to be true, the Advanced Syllabus must align with the syllabus found in HAREC. The most expedient way to achieve this alignment is to directly reference the HAREC syllabus. The ACMA is also proposing to update the Australian regulation components of the syllabus to refer to the current ACMA regulatory instruments.

~ACMA



# QR Shopping Trolley



World-first technology that tracks shopping trolley movements and unlocks them with a QR code could be a boon for consumers and help supermarkets avoid fines of more than \$13,000 for abandoned carts.

The Trolley Data Management Network (TDMN) has developed a coin less shopping trolley lock and GPS tracking system that could prevent trolleys being dumped in streets, car parks or waterways - a problem that costs councils and businesses thousands each year to remove or repair.

The Australian-owned and made tech works when users first unlock the trolley via the sMart Shop App.

Then by scanning a QR code, a \$2 deposit is made to unlock the trolley and that money is given back once the trolley is returned and relocked. Thanks to the sMart Lock System, shoppers no longer need to carry coins or tokens. All trolleys have the ability to self-report their GPS location directly to the retailer or trolley collectors' Mobile application with turn by turn navigation if it's not taken back.

Under the Public Spaces (Unattended Property) Bill 2021 that was introduced in the NSW parliament a three-hour collection time limit on trolleys, vehicles and other items causing a safety hazard will apply.

If trolleys aren't returned to supermarkets, they can be fined between \$660 to \$13,750.

Local Government NSW president Linda Scott said abandoned trolleys posed a risk to motorists, cyclists and pedestrians, and clogged local waterways. She added ratepayers spent more than \$17m each year recovering abandoned trolleys. "There are 8900 supermarkets right across NSW and thousands more stores offering the use of shopping trolleys every day," Ms Scott said.

"Recently, four western Sydney councils alone collected 550 abandoned trolleys in a single day."

*~Internet*



# TINY ANTENNA

Think you don't have room for an antenna? Researchers are experimenting with one antenna that's so small it might just blend into the wallpaper.

Scientists at Princeton University's Keller Centre for Innovation in Engineering Education have done just that. They're basing their work on something called large-area electronics, which allows electronic circuits to be created on material that is both thin and flexible. As a result, they're hoping to develop an antenna array that could be incorporated into something as thin as wallpaper or even a skin patch. Their findings are published in Nature Electronics.

A report on the Phys.org website quotes Naveen Verma, the senior author of the study, describing how the researchers adapted zinc-oxide thin-film transistor technology for wireless use. They created a phased array of antennas in a row that is 30cm, or one foot, long.

These antennas could be located practically anywhere even as wallpaper in a room making it potentially compatible with devices being driven as part of the internet of things.

~WIA News

## WIA ROSS HULL VHF - UHF MARATHON CONTEST

January, the entire month every year is the WIA ROSS HULL VHF - UHF MARATHON CONTEST  
00:00 UTC 1 January to 23:59 UTC 31 January

Read the rules understand the rules and ask questions if you do not understand how they apply.

<https://www.wia.org.au/members/contests/rosshull/>

One of the frequently asked questions:

I am entering in another contest over the month can my contacts count in the Ross Hull.  
Yes of course they can however you must do two things -

First you must exchange the requirements of the Ross Hull Marathon - Signal report, Serial number and 6-digit grid square (if possible)

Second if the contest you are in allows multiple contacts, we need you to include ALL contacts - not cherry pick - if the station worked has miss heard you then you may be penalising yourself.

Above all the Ross Hull Marathon is the celebration of the amazing life of a pioneer of amateur radio  
Enjoy the contest and we look forward to hearing you on the bands

Submitting Your Log

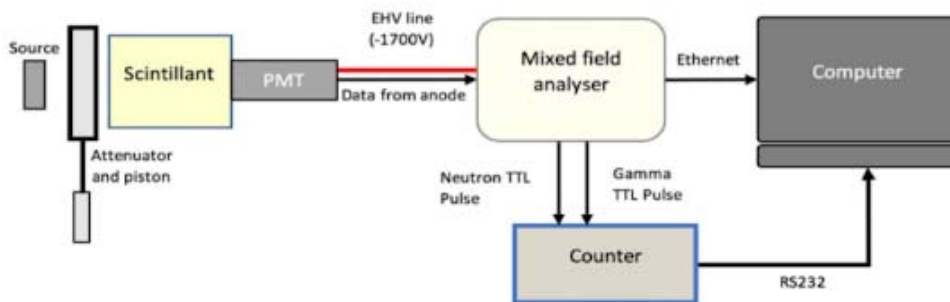
Logs can only be submitted as email attachments.

Logs email to: [rosshull@wia.org.au](mailto:rosshull@wia.org.au)

~WIA

# FORGET RADIO! TRANSMITTING WITH NEUTRONS

Throughout history, people have devised ways to send information across long distances. For centuries we relied on smoke signals, semaphores, and similar physical devices. Electricity changed everything. First the telegraph and then radio transformed communications. Now researchers at the University of Lancaster have demonstrated another way to send wireless data without using electromagnetic radiation. They've harnessed fast neutrons from californium-252 and modulated them with information with 100% success.



The setup was interesting. The radioactive material was encased in a cubic meter steel tank filled with water. A pneumatic system can move the material to one edge of the tank which allows fast neutrons to escape. A scintillating detector can pick up the increased neutron activity. It seems like it is akin to using what hams call CW and college professors call OOK (on off keying). You can do that with just about anything you can detect. A flashlight, knocking on wood, or — we suppose — neutrons.

We wondered what the practical application of this might be. The paper suggests that the technique could send data through metal containment structures like those of a nuclear reactor or, perhaps, a spacecraft where you don't want anything unnecessarily breaching the containment. After all, neutrons cut through things that would stop a conventional radio wave cold.

It seems like you only have to prove you can detect something to make this work — it really doesn't matter what it is you are detecting. It seems like it would be much harder to do more advanced types of modulation using neutrons. Maybe this is why we don't hear aliens. They are all Morse code operators with neutron-based telegraphs.

*~Hackaday*

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## WIA VHF - UHF FIELD DAYS

Summer 2022 - 0100 UTC

Saturday 15 January

Through

0059 UTC Sunday

16 January

<https://www.wia.org.au/members/contests/vhfuhf/>

# VK3RTV NEWS

DATV Channel allocations on 23 cm are, 1246 MHz, 1255 MHz, 1278 MHz and 1287 MHz respectively. Currently we have a westerly, north easterly and south easterly receive antennas at Mount View which were installed to cover the existing service areas and DVB-S/S2 implemented in line with the technology available in existing DATV stations.

1. It is proposed to have a south westerly antenna at Mount View to increase Metro coverage. The outlook from Mount View in that direction is fairly well line of sight to many locations including across the bay to the Geelong area and down the east coast of the bay.

This will require a new cable, Pre-Amplifiers and Antenna and Tower Installation.

Costing for this is being investigated, the major component being the Cable and Tower Installation.

2. Experimental inputs using DVB-T will be funded by an interested group of members of the Melbourne ATV Group. The requirement will be to have either active or passive couplers on each antenna, the preferred option being no loss active if viable. These couplers are available from Satellite TV Suppliers. High quality passive couplers are in hand.

3. Currently stations on adjacent frequency allocations are connected to VK3RTV1 and VK3RTV2 (namely 1246 and 1255) It makes sense to accommodate these on the one multiplexed channel to reduce any de-sense accorded by very strong input signals. It is therefore proposed to have 1246 and 1255 MHz DVB/S/S2/T on VK3RTV1 and 1278 and 1287 MHz DVB/S/S2/T on VK3RTV2. This change only requires re-positioning four HDMI Leads and four key lines.

*~Regards Peter VK3BFG*

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## Australian Amateurs can use AX prefix on Australia Day



The Australian Communications and Media Authority (ACMA) automatically allows all radio amateurs to substitute their normal VK callsign prefix with the letters AX, every Australia Day, Our national day this year falls on Wednesday 26th of January 2022. This gives radio amateurs the chance to be part of the commemoration the First Fleet's arrival in 1788 at Sydney Cove and the establishment of a European settlement at Port Jackson, with the raising of the British flag by Governor Arthur Phillip.

On Australia Day many celebrate our country and culture. This includes the granting of awards, honours and the welcoming to citizenship of many immigrants. National flags will be flown and the celebrations include fireworks displays.

The AX prefix is popular among prefix hunters and others. The use of a special QSL card is encouraged by the Wireless Institute of Australia.



## *Australia Ham Radio 40 Meter Net*



7 Days a Week  
10am Local time  
(East coast)

**7.097 MHz LSB**

Approximately + or – QRM

Hosted by Ron VK3AHR

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## NEVARC 2 Meter Net

Net Control VK3ANE

**VK2RWD**

**Wednesday - 8.00pm**  
Local time

President, VK3VS, Matt  
Vice President, VK2VU, Gary  
Secretary, VK2BFC, Frank  
Treasurer, Amy Bilston



## NEVARC CLUB PROFILE

### History

The North East Victoria Amateur Radio Club (NEVARC) formed in 2014.

As of the 7th August 2014, Incorporated, Registered Incorporation number A0061589C.

NEVARC is an affiliated club of the Wireless Institute of Australia and The Radio Amateur Society of Australia Inc.

### Meetings

Meetings details are on the club website, the Second Sunday of every month, check for latest scheduled details.

Meetings held at the Belviour Guides Hall, 6 Silva Drive West Wodonga.

Meetings commence with a BBQ (with a donation tin for meat) at 12pm with meeting afterwards.

Members are encouraged to turn up a little earlier for clubroom maintenance.

Call in Via VK3RWO, 146.975, 123 Hz tone.

### NEVARC NETS

#### HF

7.097 MHz      7 Days a Week - 10am Local time

#### VHF

VK2RWD      Wednesday - 8.00pm Local time      VK2RWD & VK3RWO & VK3RWC are linked

### Benefits

To provide the opportunity for Amateur Radio Operators and Short Wave Listeners to enhance their hobby through interaction with other Amateur Radio Operators and Short Wave Listeners. Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of likeminded radio and electronics enthusiasts. Excellent club facilities and environment, ample car parking.

**Website:**      [www.nevarc.org.au](http://www.nevarc.org.au)

**Postal:**      NEVARC Secretary  
PO Box 8006  
Birallee Park  
Wodonga Vic 3690

**Facebook:**      [www.facebook.com/nevicARC/](https://www.facebook.com/nevicARC/)



All editors' comments and other opinions in submitted articles may not always represent the opinions of the committee or the members of NEVARC, but published in spirit, to promote interest and active discussion on club activities and the promotion of Amateur Radio.

Contributions to NEVARC News are always welcome from members.

Email attachments of Word™, Plain Text, Excel™, PDF™ and JPG are all acceptable.

You can post material to the Post Office Box address at the top of this page, or email [magazine@nevarc.org.au](mailto:magazine@nevarc.org.au)

Please include a stamped self-addressed envelope if you require your submission notes returned.

Email attachments not to exceed 5 Mb in file size. If you have more than 5 Mb, then send it split, in several emails to us.

Attachments of (or thought to be) executable code or virulently affected emails will not be opened.

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While we strive to be accurate, no responsibility taken for errors, omissions, or other perceived deficiencies, in respect of information contained in technical or other articles.

Any dates, times and locations given for upcoming events please check with a reliable source closer to the event.

This is particularly true for pre-planned outdoor activities affected by adverse weather etc.

The club website <http://nevarc.org.au> has current information on planned events and scheduled meeting dates.

You can get the WIA News sent to your inbox each week by simply clicking a link and entering your email address found at [www.wia.org.au](http://www.wia.org.au). The links for either text email or MP3 voice files are there as well as Podcasts and Twitter. This WIA service is FREE.